



Ross School of Business at the University of Michigan

**Independent Study Project Report**

**TERM** : Winter 2006

**COURSE** : Strategy 750

**PROFESSOR** : Allan Afuah

**STUDENT** : Marc Conkle

**TITLE** : Vonage: Taking Advantage of VOIP

# **Vonage: Taking Advantage of VOIP**

**By**

**Marc Conkle**

**750 Independent Research Project  
Michigan Ross School of Business**

**April 2006**

**Faculty Advisor:**

**Allan Afuah  
Association Professor of Strategy**

---

## Faculty Comments

*(Evaluative comment in which the faculty supervisor should briefly describe the nature of the research project and add an evaluating comment)*

### *Nature of project*

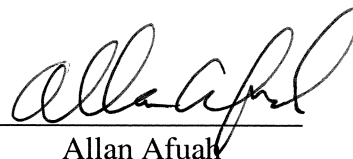
Voice over Internet protocol (VOIP)—a technology that, among other things, allows people to make phone calls over the Internet—promises to disrupt the business models of not only major telecommunications companies such as AT&T and MCI but also those of cable companies and wireless providers.

### *Evaluating comment*

Marc Conkle performed detailed research of VOIP's impact on business models and wrote an enlightening case with Vonage as the anchor. The final document is a must read for anyone who wants to understand the threat that this new technology poses to investments in fixed wire telecommunications, cable and wireless. An Excellent job!

April 28, 2006

Date



Associate Professor of Strategy

Faculty must complete "Faculty Comments" page and attach it to the cover of the paper before submitting the paper to Kresge Library.

Faculty enters the student's grade via Web Grades or returns a Supplementary Grade Report to Academic Services

Contact the Academic Services staff if you have any questions about these procedures.  
Telephone 734/647-4933 or email: [rossacadservices@umich.edu](mailto:rossacadservices@umich.edu)

## Vonage: Taking advantage of VOIP

As Michael Snyder stared out his office window, he reflected upon the many challenges that he must tackle since becoming CEO of Vonage in February, 2006. His company's Voice over Internet Protocol (VoIP) service was dependent upon broadband providers to supply high speed Internet access. For years, these providers had been content to stay out of the telephone market. However, technology has allowed the quality of "internet phones" to be almost indistinguishable from traditional phone carriers, as evident by the recent rapid growth of VoIP subscribers in the United States. Now Internet providers were looking to offer telephone themselves in a "triple play", bundling cable television, Internet, and phone service together. And while Vonage had spent millions on educating the public of VoIP's benefits, other pure play competitors were offering comparable products at discounted rates. Finally, Vonage currently had several regulatory matters pending before the federal government. Snyder was certain that the days of a relatively unregulated industry were now over. Despite all of these challenges, Vonage still benefited from being the largest VoIP provider in the United States, with almost 1.5 million customers and connecting over 42 million calls per week.<sup>1</sup> Could it still remain the dominant player?

### History of Telephony

The telephone can be traced back to March 18, 1876 when Alexander Graham Bell beat out Elisha Gray by the matter of only a few hours in filing his patent for transmitting speech electronically. Initially conceived as a way to improve the then 30 year old telegraph system, Bell's research was based on the principle that several tones could be sent simultaneously along the same wire if the signals differed in pitch. His "harmonic telegraph" patent was offered to Western Union, the virtual monopoly of information transmission in the United States, for \$100,000<sup>2</sup> (\$1.8 million in today's dollars).<sup>3</sup> However, Western Union president William Orton scoffed at the idea, famously uttering the reply, "What use could this company make of an electrical toy?"<sup>4</sup> Not deterred, Bell saw the potential of his invention and the possibility to disrupt the current method of communication.

"I believe in the future wires will unite the head offices of the Telephone Company in different cities, and a (person) in one part of the country may communicate by word of mouth with another in a different place."<sup>5</sup>

When Alexander Graham Bell along with several other investors formed the Bell Telephone Company on August 1<sup>st</sup>, 1877, there were only 778 telephones in operation.<sup>6</sup> Because the call range was only one to two miles while prices were several dollars per call, early adopters were usually limited to businesses and wealthy households who justified fixed line communication between two points. Later, in January 28, 1878, the first commercial switchboard began operating in New Haven, Connecticut.<sup>7</sup> Each phone was physically connected by a copper wire to a central office, also known as a Public Switch Telephone Network (PSTN), where a switchboard operator would be responsible for physically interconnecting the two lines. Telephone users now had the freedom to connect to people across multiple lines, but long distance calls were still relatively

expensive because individuals were essentially paying for pieces of copper wire to be connected all the way from the originating phone to the destination phone, and for that connection to remain constant throughout the call. Several wealthy backers in Massachusetts and Rhode Island were convinced by one of Bell's partners to finance the development of the telephone in New England, creating the New England Telephone Company in 1878. This new company was restricted to a policy of leasing rather than selling equipment to the customer and that all telephone instruments were to be purchased from only the Bell Telephone Company at a price of \$3 per telephone.<sup>8</sup> Theodore Vail, brought in to manage the Bell Telephone company later that same year, expanded upon this licensing principle by giving away telephone franchises in Chicago, Philadelphia and New York. In building a national network, Vail discovered that Bell could retain a portion of stock in these new companies as repayment for the franchise while earning income through dividends and local rental charges. This model created a boom as licensed telephone companies sprung up around the nation. By 1881, there were 132,000 telephones in service and only nine cities of more than 10,000 inhabitants in the United States were without a telephone exchange.<sup>9</sup> Believing that long distance lines were critical to the telephone's success, Bell created a new subsidiary in 1885 to render telephone toll service across burgeoning licensed companies. This new company, the American Telephone and Telegraph Company (AT&T), was to be responsible for bookkeeping and cost accounting for the nation of networks.

Western Union, recognized that stockbrokers preferred the telephone's two-way conversation over the one-way stock ticker, realized the value of telephones and immediately organized the American Speaking Telephone Company. This new subsidiary, using Elisha Gray's patents, commissioned Thomas Edison to invent a superior telephone. With a better product, large network of existing wires, and solid financial position, it appeared that Western Union would quickly crush the smaller Bell Telephone Company. However, an internal leadership battle within Western Union, the threat of patent infringement litigation, and a firm belief that the telephone was a minor segment of the overall total business, Western Union agreed to sell off its systems in 1879 and remain out of the telephone business.

A major challenge occurred in 1892 when the original Bell patents expired. Occurring during an economic depression, there was a surplus of idle factories eager to produce telephones while many municipalities were still waiting for telephone service. During the next six years, more than 6,000 telephone companies were started in the United States and the number of telephones boomed from 285,000 to 3,317,000.<sup>10</sup> Increased competition among multiple companies created duplicate systems within the same geographies. Over capacity and the lack of efficiencies all but guaranteed that many of these companies would soon exit. Complicating matters, as growth exploded and prices dropped, many companies were inadequately prepared financially to handle system upgrades required by increased demands and as new technologies emerged. The original American Bell Telephone Company, being incorporated in Massachusetts, was financially limited by law to \$10 million in capitalization and stock ownership in associated companies. To gain access to much needed capital while overcoming this legal obstacle, assets were transferred from the American Bell Company to AT&T of

New York in 1899. With a capitalization of nearly \$71 million and total assets of over \$120 million, AT&T was financially and strategically positioned to interconnect subscribers of dissimilar telephone companies together, offering value by providing "universality."<sup>11</sup> Charging a 4.5 percent fee against gross operating revenues for using their network to connecting independent telephone companies and AT&T's own acquisition of several independent telephone companies attracted the attention of federal regulators. In a letter later dubbed the "Kingsbury Commitment," AT&T agreed in 1913 to divest of some of its holdings, to provide long distance service to independent telephone companies, and to buy additional independent telephone companies only when the purchase was discussed with and agreed up by the Interstate Commerce Commission.

Thus, AT&T operated as a regulated monopoly for the next several decades. For ten brief months during World War I, the U.S. government took control of running this "civilian" service, but operated at a loss and AT&T was quickly restored back to private hands in 1919. In 1921 the Graham-Willis Act legalized the previous Kingsbury Commitment and defined AT&T as a "natural monopoly," providing long-distance service to all independent telephone companies. The company continued to grow and by 1939 controlled 83 percent of all U.S. telephones and 98 percent of all long-distance telephone lines.<sup>12</sup> In 1949 the Justice Department brought suit against AT&T under the Sherman Antitrust Act, seeking to divorce Western Electric, the electrical equipment manufacturing subsidiary, from the Bell System. Fought for several years, the suit ended in 1956 with a consent decree that kept Western Electric in the system but restricted monopolistic practices.

In the years to come, telephones continued to expand in the market; fifty percent of American households had telephone service in 1945, seventy percent in 1955, and ninety percent in 1969.<sup>13</sup> By 1970, AT&T had almost one million employees and was the largest company in the world. In 1974, the United States instituted a second antitrust suit against AT&T. After years of litigation, the U.S. Department of Justice and AT&T reached an agreement in 1982 whereby AT&T would divest itself of 22 wholly owned Bell regional exchanges and that these companies would become separate entities, operating as local telephone networks.

In 1984, these businesses were reorganized and converted into seven regional phone companies: Ameritech, Bell Atlantic, BellSouth, Nynex, Pacific Telesis Group, Southwestern Bell Corporation, and US West. AT&T relinquished the use of the name Bell to these Regional Bell Operating Companies (RBOCs), which became informally known as "Baby Bells". Although it had lost the local network business, AT&T remained the nation's largest provider of long-distance telephone service and was free to compete in such previously forbidden fields as data processing and computer communications. RBOCs since this time have since merged, leaving only 4 regional telephone companies in the United States (**Exhibit 2**). It is estimated that fewer than 5% of residential consumers in the U.S. have a choice of traditional local service telephone provider<sup>14</sup> and recently, there has been a flurry of consolidation within the telecom industry. Sprint and Nextel merged in 2004. SBC purchased AT&T in January, 2005 for \$16 billion, deciding to keep the AT&T name. In May, 2005, Verizon acquired long

distance provider MCI for over \$8 billion. Most recently, AT&T and BellSouth announce an agreement to merge, pending regulation approval. The U.S. local phone telephone network has 119.2 million residential telephone access lines, representing \$67.2 billion of local, long distance, and related revenue.<sup>15</sup>

### **Telephones Go Digital**

During the early days of telephony, Bell Laboratories was world renowned for continuing to push the boundaries of technology. Notable accomplishments included the modern transistor and the Telstar satellite communications system. In his 1948 paper, "A Mathematical Theory of Communication", Bell Labs scientist Dr. Claude Shannon proposed using coded electronic pulses to transfer information. Pulse Coded Modulation (PCM) was pivotal in the transformation of telecommunications from analog to digital during the 1970s. Previously, voice was passed as an analog signal along not one, but two physical lines, one for each of the two parties. This proved to be extremely inefficient and not essential during a typical conversation where, while one person is talking, the other person is usually listening. Furthermore, if a system could distinguish between useful speech and unneeded silences, it could eliminate the transmission of pauses rather than wasting valuable circuit bandwidth.

In a digital system, the analog signal is converted by an Analog to Digital Converter (ADC) into digital signal. Using software protocol (a set of rules and formats), these bits are compressed into data packets. The compressed packets are labeled with a destination address and combined with several other signals in a process called multi-plexing. Over a network line, data is sent the least congested and cheapest route available, typically calculated using line routing tables. Packet switching opens connections just long enough to send bits of data from one network to another rather than using a constant connection. Upon arrival at the destination, the packets are disassembled, data is extracted, and the digital information is once again converted to an analog signal. Thus, while the end instrument remains analog, the major backbone network that the signal travels across is digital, being much more efficient and taking half to one eighth of the bandwidth.

The major benefit by switching to a digital signal is cost reductions, especially in the hardware required. Circuit-switched networks are very expensive, due in large part to the fact that users have exclusive use of a connection until the conversation is over and the connection is released. Moreover, traditional voice and data services must be carried on different wires and thus need separate hardware to accommodate the two types of traffic. Telephone companies pass along the costs of building and maintaining a circuit-switched network to the consumer in the form of higher rates for their telephone services. Building a new network from the ground up is also not a very feasible solution. It is estimated that a modern fiber optic voice/data network costs approximately \$75,000 per mile, depending on fiber, build construction (buried, poles, urban streetscapes, etc.), and right of way management.<sup>16</sup> A national data grid of 50,000 miles would cost in the range of \$1 to \$5 billion. However, many traditional telephone companies realized that they could use alternative data networks, such as the Internet infrastructure to connect PSTN calls rather than using their own networks.

### **Impact of Packet Based Telephony on Networks**

The same 1984 regulation that split up AT&T to create the “Baby Bells” also required local carriers to allow their customers equal access to choose their long distance provider. This set the stage for companies to become long distance carriers, using VoIP as the vehicle to drive down their costs.

The transition to packet based telephony during the late 1990s had a major impact on the industry. Capital was invested to upgrade networks and update hardware. Network Access Points (NAPs) were installed for providers to connect their networks and exchange traffic. “Soft switches”, a form of Media Gateway Controller (MGC) replaced outdated, physical Class 5 switches. These new MGSs had a lower cost of development, deployment and ownership while providing enhanced customer service and better integration of dissimilar networks. The infrastructure was in place and telephone providers were poised to use this revolutionary new method of communication.

### **Computer-to-Computer VoIP**

The major telecoms were not the only ones who saw the potential in using the existing internet as the backbone to transmit voice signals between end users. On February 15, 1995 the Israeli company VocalTec was credited with inventing the first “Internet phone.”<sup>17</sup> Founder Elon Ganor, along with a group of seven engineers focused on creating software for computer users to communicate by voice, similar to using a telephone. Multiple factors converged for this to occur. First, computers were able to connect to one another via the internet. As Internet Service Providers (ISPs) negotiated to interconnect with one another, networks expanded to bring together customers that were previously isolated. Second, this same network provided the perfect medium to transmit software, one of the first e-commerce products, for users to install themselves. As new products and updates became available, the distribution channel was already established. Third, hardware was developed to transmit and receive sound. Early computer soundcards were limited to the playback of sounds, but soon progressed to allow the transmission of sound via a microphone. Originally half-duplex, the hardware could only either send or receive at the same time, but not both simultaneously, similar to a CB radio or walkie-talkie. By the mid 1990s, soundcards were capable full-duplex, the ability to transmit as well as receive at the same time.

With VocalTec’s pioneering Internet Phone Software, users were able to use a computer equipped with a microphone and proper hardware to compress their voice signal, convert it into data packets, and then transmit it out over the Internet to the other party, where it would be converted back into a sound signal. This particular technology worked as long as both parties were interconnected by their Internet Service Providers (ISP) and were using the same software. While many companies offered various software solutions, the inability to connect across different software platforms favored the consolidation of a few major players. As these companies grew larger, it became more difficult for new entrants to unseat entrenched players.

Early adopters were tech savvy hobbyists who were attracted to the appeal of communicating around the world to anyone on the same network. But as more people



gained internet access and the quality of service approached an acceptable threshold, more mainstream users recognized the benefits of VoIP.

### **VoIP Methods**

While digital packet based telephony was driving down costs for traditional long distance phone carriers, others saw the emerging Internet as a way of bypassing local exchange carriers completely and access customers directly through their network connection. To overcome the stigma of being tethered to the home computer and requiring specialized software, new user gateway devices emerged to replicate the traditional phone system. Analog Telephone Adaptors (ATA) were created to allow users to connect the phones that they already used in their household and act as a bridge to link with their home computer. The analog signal from the phone is converted by the ATA hardware to a digital signal and data packets which is then be transmitted across the customer's internet connection. The main benefit of an ATA is that the user does not need any new equipment other than the ATA converter and that the customer's pre-existing phone equipment could still be used. Rather than sitting in front of a computer, the customer could find it more comfortable interfacing with a traditional telephone experience. Furthermore, cordless phones with their base units attached to an ATA allowed users to roam freely around their home while using a VoIP service.

As digital telephone hardware advanced, companies also saw the opportunity to bypass the computer all together. Targeted towards businesses and small enterprises, VoIP providers recognized that phones could be built with the hardware and software already pre-installed within the phone. These IP phones have a similar outer appearance to that of a traditional phone. Upon closer examination, the real difference is in the wall jack connection where a RJ-45 Ethernet jack is used instead of the traditional RJ-11 telephone jack. The phone plugs in directly to an Ethernet port or router, so a computer can be completely circumvented. IP telephones also allow organizations to use software based Private Branch Exchanges (PBX), whose cost is substantially less than traditional wired systems.\*

### **Benefits / Drawbacks of VoIP**

VoIP provides the following benefits:

- **Costs**-Most computer-to-computer calls are free and are subsidized by revenue from advertising messages at the beginning of the call. For computer-to-phone or phone-to-phone calls using a VoIP carrier, long distance costs are dramatically less than from traditional long distance carriers, typically charged at a monthly flat rate of around \$25 for unlimited domestic calling. Price per minute for international calls vary by country. VoIP users do not pay local access charges but does incur regulatory fees.

---

\* The Private Branch Exchange (PBX) is the telephone system within an enterprise that switches calls between enterprise users on local lines while allowing all users to share a certain number of external phone lines. The main purpose of a PBX is to save the cost of requiring a line for each user to the telephone company's central office. While a 40 user standard PBX can cost up to \$50,000 upfront, a "Soft PBX" using IP phones can be implemented for approximately 80% less and with an operational savings of 20% (Gary Kim, "The Pitch for Hosted IP-PBX Hits on Savings," Fat Pipe, URL: [www.fatpipeonline.com/features.php?feature\\_id=39](http://www.fatpipeonline.com/features.php?feature_id=39), April, 2006).

- Portability-With software based calling or by taking along an ATA box, one can make a call anywhere that has a broadband connection, even internationally. Customers can be reached at their same phone number, despite changing physical locations wherever they are traveling.
- Virtual Phone Numbers and Multiple Lines-Some carriers provide users the choice of a phone number with any area code regardless of the subscriber's location. A student in Ann Arbor could have a Florida number so that their parents in Miami can call a local number without being charged long distance. This student could also get a second virtual number with a New York City area code to be tied together to the same line. In a single office, each member of a sales force could have a local number covering their respective geographic region.
- Find Me / Follow Me-Inbound calls can be forwarded to any other phone number (cell, office, home, etc.). It can be scheduled to ring simultaneously or sequentially.
- Additional Service-Some VoIP providers allow users to check voicemail via e-mail or receive VoIP voice messages as email attachments. Web interfaces allow customers to review detailed calling logs or applying customized messages to certain callers.
- Multi-Media Bundling-Because VoIP is carried over the internet, some providers allow additional data can be sent during phone call, such as images, graphs, or videos.

Despite all of these benefits, there remain several drawbacks to VoIP. In the nascent stage of internet telephony, the sound quality was not comparable to that of the standard telephone equipment in use at that time. As packets of voice encoded data travel the network in the path of least congestion, parts of the call would be split up and transmit along separate paths, later to be reassembled at the end user. Without a mechanism to ensure that data packets are delivered in sequential order, early VoIP implementations faced problems with jitter, latency, and an "echo effect". However, as the technology developed, most of these issues were resolved through hardware and software solutions so that sound quality is almost indistinguishable from traditional carrier methods.

Home users are constrained by the bandwidth of the data pipeline, initially 14.4 to 33 Kbps (kilobits per second) dial-up modems for internet access. However, a typical VoIP telephone call will require a data transfer rate of 60 to 90 Kbps, depending on the sample rate and coding algorithm.<sup>18</sup> But as broadband internet penetration increased, bandwidth became less and less of an issue.<sup>†</sup> By 2004, 39% of all US Internet users reported having high speed internet access at home.<sup>‡</sup> However, customers, in addition to their VoIP service charges, must pay a fee to their ISP for providing an Internet connection, ranging from \$30 to \$50. Moreover, broadband is still not available everywhere in the United

---

<sup>†</sup> It is generally agreed that broadband service is characterized by providing a minimum data rate of 256 Kbps, usually by cable modem or Digital Subscription Line (DSL).

<sup>‡</sup> John Horrigan, "Broadband Penetration on the Upswing," Pew Internet & Life Project, April, 2004.

The report goes on to state that 77% live in an area where broadband is available, 8% live in an area where it is unavailable, and 15% state that they do not know. Of those who live in a place where they say broadband is not available, 54% say they would like to get it.

States. Because VoIP relies on the internet to provide a transmission network, power and internet outages will cause the phone to be inoperable. This can be extremely critical in times of disaster when communication is essential.

The biggest hurdle facing the VoIP community is emergency 911 access (E911). In a traditional telephone company, emergency calls are routed over a dedicated infrastructure directly to an emergency dispatcher at a Public Safety Answering Point (PSAP). In almost all cases, the dispatcher automatically receives the caller's location and phone number. Because VoIP calls are routed over the internet, when a customer calls 911, their actual location cannot be accurately determined. Instead, their registered location on file with their VoIP provider is passed along to the 911 dispatcher, which may or may not be the caller's actual location. Moreover, some local emergency authorities are not capable of receiving the transmission of the caller's registered location and/or phone number and may have to depend upon the information being passed along verbally.

Despite these drawbacks, over one million U.S. subscribers were estimated to be using VoIP in 2004 and this number is expected to continue grow at a rate of 60% to 100% (**Exhibit 6**).

## **Vonage**

### *History & Services Products*

In January, 2001, Jeff Citron launched the VoIP company Vonage in Edison, New Jersey. Citron's previous experience was in financial services, where he found the computerized trading system The Island ECN in 1995. After a \$503 million acquisition by the Instinet Group, Citron moved on to start Datek Online Holdings Corp. Under his leadership as chairman and CEO, Datek grew to become the fourth largest online brokerage firm in the U.S. before being acquired by Ameritrade for \$1.3 billion. Always interested in disruptive technologies, Citron sought a new challenge to use technology to empower the consumer. Just as he had previously upset the traditional nature of financial brokers by allowing end users to book trades themselves online, Citron saw a way to shift the relationship between major telecoms and their customers.

Vonage's product was in development for almost a year before being launched in April, 2002. They entered the VoIP space as a method for consumers to use their existing telephones with an Analog Telephone Adaptors (ATA) to connect to conventional telephone numbers over the Internet. Vonage offers two residential calling plans and two calling plans that cater to small or home offices (**Exhibit 12**). 88% of US subscribers use the residential service. Of this, 67% prefer the premium plan, offering unlimited minutes.<sup>§</sup> Prices for the Residential Unlimited Plan have continued to decrease over the past several years.

### Price for Vonage's Residential Unlimited Plan

Inception	\$39.99
September, 2003	\$34.99

<sup>§</sup> All operational figures, unless otherwise noted, are from company reports filed with the SEC on February 8<sup>th</sup>, 2006.

May, 2004	\$29.99
October, 2004	\$24.99

In addition to the four main plans, Vonage offers several premium services such as Fax Service, Toll Free Plus, and SoftPhone, a software based system to send and receive calls directly with a computer without requiring phone adaptor hardware. These additional services are each \$4.99 to \$9.99 a month to add. Upon initial enrollment, customers are typically charged hardware costs and a one-time activation fee of \$29.99, although promotions sometimes discount or waive these charges altogether. Average monthly revenue per customer is \$26.63.

Since the company inception, the number of customer subscribers has grown from 85,000 in December 2003 to 390,000 in December 2004 to nearly 1,300,000 in December 2005. During the first half of 2005, the number of Vonage employees more than doubled, growing from 648 to 1,387.

The North American Number Plan Administrator and the Pooling Administrator control the distribution of telephone numbers in the United States. Because Vonage is not a regulated telecommunications provider, they are prohibited by the FCC from directly obtaining numbers themselves, relying on telephone companies and contractual obligated third parties to facilitate the transfer of a new customer's previous phone number. Although steps have been taken to automate more of this procedure, it is still a highly manual process, requiring up to 20 business days or longer to transfer a customer's phone number from a traditional carrier to Vonage's service. By comparison, transferring traditional telephone numbers among traditional service providers generally takes one to two days. Wireless telephone numbers transferred among wireless service providers can be accomplished in several hours.

#### *Hardware Products*

Vonage provides several hardware products:

- Analog Telephone Adapter-Manufactured by Linksys, these stand-alone adapters convert analog audio signals from traditional phones into digital data packets for transmission over the Internet.
- Integrated Adapter and Router-Manufactured by Linksys and Motorola, these combine the adapter and broadband router into one integrated device. Wireless functionality (WiFi) is an add-on option.
- Integrated Cordless Phone, Adapter, and Router-Manufactured by VTech with similar offerings from Uniden and other leading cordless phone manufacturers, this device allows mainstream customers to freely roam around their home using a VoIP phone without feeling tethered to their computer. A partnership with Texas Instruments has resulted in Vonage-certified VoIP chipsets, licensed for a variety of common communication devices.
- WiFi Phone-By connecting to wireless Internet access points, the pocket sized UTStarcom F1000 can connect to Vonage service wherever there is an open WiFi hotspot or compatible location.

### *Costs*

Most of the direct costs of Vonage's telephone service are fees that are paid to third parties on an ongoing basis. They include:

- Access charges paid to other telephone companies to terminate domestic and international calls on the Public Switched Telephone Network (PSTN). This accounts from approximately 63% of all direct costs.
- Leasing interconnections to route calls over the Internet and transfer calls between the Internet and PSTNs of various long distance carriers.
- Monthly leasing of local telephone numbers from other telephone companies to provide to Vonage customers. This is estimated to be approximately \$0.50 per number per month, although can vary depending on carrier and contract arrangement.
- Costs of co-locating regional data connection point equipment in third-party facilities owned by other telephone companies.

In March 2004, direct costs were \$12.06 per line but were reduced to \$8.56 by September 2005. This decrease is mostly due to increased purchasing power and, to a lesser extent, cost savings associated with more calls between Vonage users, which do not have termination costs associated with them. Costs, driven by FCC E911 compliance, is expected to increase for the end of 2005 and into 2006.

### *Billing & Customer Service*

Customers are billed to their credit cards one month in advance and an electronic statement is emailed to them. A detailed log of all of their calls and charges are also available online at Vonage's website.\*\* Many customers use the online account management feature to manage their own services. For example, customers can:

- View a lifetime log of incoming and outgoing calls
- Listen to voicemail or change voicemail settings
- Add, change, or terminate account features
- Change call forwarding, call blocking, and call waiting settings

In addition, Vonage offers customer service 24 hours a day, seven days a week, through a toll free service number. One of the most common customer problems involves resolving home network firewalls during initial installation. Customer care is viewed as essential to provide differentiating service and retaining users. However, Vonage faces a high turnover rate among customer care employees and must continue to hire and train representatives at a rapid rate in order to meet the needs of a growing customer base. While all calls are handled internally at the New Jersey call center, Vonage is exploring other sourcing alternatives.

### *Distribution Channels*

---

\*\* By comparison, a RAND study concluded that 90% of the cost of telecommunications goes towards billing and accounting. (Robert Cannon, "Legal Developments: FCC releases Reciprocal Compensation Order," Boardwatch Magazine, May 1999).

The primary channel has been direct sales through their website [www.vonage.com](http://www.vonage.com). At the end of 2004, Vonage launched a retail channel, partnering with national retailers such as SAM's Club, RadioShack, Best Buy, Circuit City, Staples, Fry's Electronics, Office Depot and CompUSA. This move was to further expose Vonage to the mainstream public who may otherwise be unaware of VoIP technology. At the end of 2005, 78% of all new subscribers were from the direct sales channel with the remaining 22% coming from the retail sector.

### *Marketing*

Vonage has spent over \$246 million for online, television, print, radio, and promotional marketing campaigns. During the first nine months of 2005 alone, \$176 million was spent on Vonage's ad campaign, one of the top buyers of Internet ads.<sup>19</sup> Frost & Sullivan called the Vonage brand "synonymous with VoIP." The Refer-a-Friend program, which provides two months of free service (up to \$50) for each referral, generates 13% of all new subscribers. Churn<sup>††</sup> is a low 2.11%, but even at that rate, new customers have to be acquired on an ongoing basis just to maintain the existing level of customers and revenue.

### *International Expansion*

Vonage launched its service for customers in Canada in November 2004 and in the United Kingdom in May 2005. It is currently exploring further offerings in other countries. Because customers can use Vonage's services anywhere that a broadband connection is available, including countries where VoIP is illegal, governments may attempt to assert jurisdiction, resulting in potential liability and regulation. In 2006, Vonage offered customers the ability to obtain local telephone numbers from Austria, France, Italy, Mexico, Ireland, and Spain and is expected to expand to other countries, pending local policy regulations. They also have received a Service Based Operator license to provide IP Telephony services in Singapore.

### *U.S. Regulation*

The VoIP industry, being classified as an information service rather than a telecommunications service, has developed in an environment relatively free from governmental regulation.

In 2004, the state of Minnesota brought litigation against Vonage, contending that Vonage looked like a phone service, acted like a phone service, and therefore was a telecommunications company as defined by Title 2 of the Telecom Act of 1996. The state ordered Vonage to possess a competitive local exchange carrier (CLEC) certificate, to pay all taxes, and to fulfill the obligations of a CLEC, such as lifeline services, independent power sourcing, and paper billing. Vonage argued that it was a data service, not a telecom service, since the enterprise works over the Internet, relying on a broadband connection. The battle went to federal court where a permanent injunction was awarded to prevent the state from regulating VoIPs as telecom services. California, New York, and Ohio have all appealed the FCC's decision and a final ruling of exactly who has final regulatory control over VoIPs may not be determined until late 2006.

---

<sup>††</sup> Churn is total size of the customer base divided by the number of subscribers lost.

In June, 2005 the FCC released two orders to all “interconnected VoIP services”, those providers who send or receive calls to or from the Public Switched Telephone Network. The first required all providers to notify their customers regarding the details of their emergency 911 (E911) services, an edict which Vonage was able to comply. The second required VoIP providers to offer enhanced emergency dialing capabilities to all customers by November, 2005. The terms stated that providers must use a dedicated wireline E911 network to transmit customers’ 911 calls, callback number, and customer-provided location information to the emergency authority serving the customer’s specific location. Vonage was physically unable to comply with this requirement for a significant portion of customers in specific network area markets. Vonage uses a national call center operated by a third party and staffed 24 hours a day to handle emergency calls by collecting critical information and coordinating connecting the caller to the appropriate emergency service provider. However, some local emergency authorities do not have the infrastructure required to receive the transmission of the caller’s registered location and/or phone number and may instead have to depend on verbally passing along this information. After filing for an extension with the FCC, Vonage is awaiting if their petition would be accepted or if enforcement actions such as monetary fines or cease and desist orders will be levied.

As an information service, Vonage has not been required to pay into the Universal Service Fund (USF). Established as a rural subsidy program for building out phone service in underserved areas, all telecom carriers contribute to this \$6 billion fund. Indirectly, though services paid to suppliers, Vonage contributes the equivalent of \$1.00 per subscriber. In 2006, the FCC was considering changing the USF structure such that fees are assessed based on the use of telephone numbers. If approved, Vonage may be required to contribute directly, which would have an estimated cost of \$1.07 per customer.<sup>20</sup> Vonage is actively lobbying that these funds, if charged directly, should be used to expand U.S. broadband penetration rather than pay for extending traditional phone service.

#### *Change in Management*

In February, 2006, Vonage founder Jeff Citron stepped aside to become Chief Strategist while retaining his title as chairman. Michael Snyder, formerly of ADT Security Services, joined the board of directors and became the new CEO of Vonage.

#### **Competitors**

In 2006, there were an estimated 1100 VoIP providers, approximately six which provide 95 percent of all VoIP service.<sup>21</sup> They can be characterized within one of the following categories:

##### *Pure Play*

These companies use ATA hardware similar to Vonage to connect traditional phones to the Internet. Packet8 was considered one of the first VoIP companies to offer true E911 and differentiates itself by providing VideoPhones to their customers. Packet8 also uses a referral marketing program, granting \$25 credit for each new account, but has

considerably less direct marketing or customer service costs than Vonage. Consequently, it provides an unlimited residential service for \$19.95 per month.

#### *Computer-to-Computer*

These VoIP provider uses software to provide free computer-to-computer calls, usually subsidized by revenue from ad placement at the beginning of the call. Because computer-to-computer calls avoid the PSTN completely, they are a favored choice for international users who wish to avoid a per minute surcharge. Since it's launched in 2003, Skype has had over 86 million downloads worldwide. Its two premium services, SkypeOut and SkypeIn allow users to make outbound calls to traditional landlines or receive inbound calls from landlines, each by purchasing prepaid credits. However, the vast majority of customers continue to use only the free computer-to-computer service. Because it is strictly a software based company, the marginal cost for each incremental customer is nearly zero with the majority of costs in business and software development. In 2005, Skype was sold to eBay for \$4 billion.

Other Internet companies such as Google, Yahoo, and Microsoft all offer add-ons to their Instant Messaging (IM) software to allow computer-to-computer calls. While this service is free, it requires both parties to be running the same software and does not allow inbound/outbound calls to traditional phone networks.

#### *Cable Broadband Providers*

Comcast, the nation's largest cable company, is in the process of rolling out telephone service to more than 40 million homes. Previously, cable companies have been kept out of the telephone industry by the Baby Bells who have controlled the last mile going into households. However, the strong growth of broadband has allowed cable providers an alternative by piggybacking telephone service on their cable pipelines. Moreover, by offering a bundled service, cable providers can afford to provide telephone service at, or even below costs, as long as they can make up the difference with other combined services such as internet service and video content.

Broadband providers have threatened to start restricting customer access to various content. In a BusinessWeek interview, AT&T CEO Edward Whitacre responded to a question about Vonage, Google, and MSN:

"What they would like to do is use my pipes free, but I ain't going to let them do that because we have spent this capital and we have to have a return on it. So there's going to have to be some mechanism for these people who use these pipes to pay for the portion they're using. Why should they be allowed to use my pipes?"<sup>22</sup>

Congresses may no longer be able to take a hands off approach to the internet and may have to address regulatory issues regarding broadband providers. Representative Joe Barton introduced a network neutrality bill in March, 2004 that would restrict internet providers from engaging in discriminatory practices. However, the House subcommittee struck down the amendment and its future is still unknown.



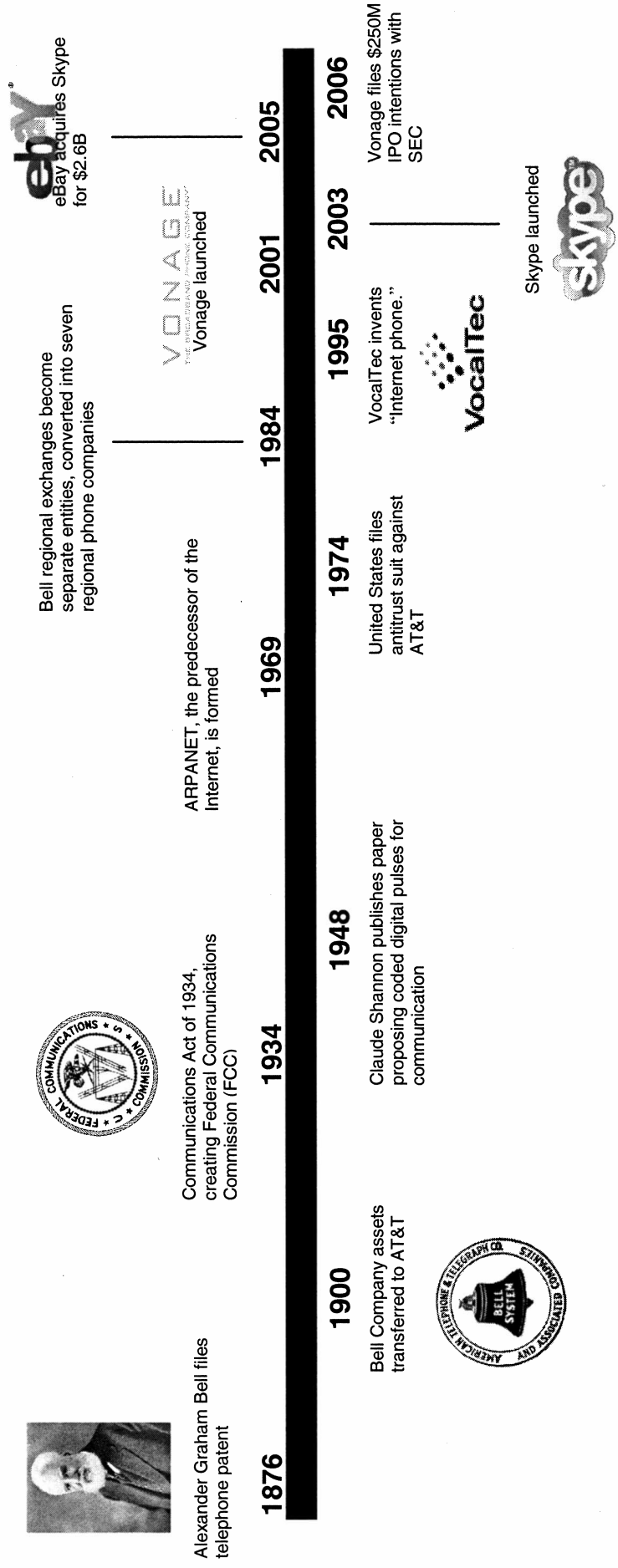
### *Unforeseen Disruptive Technologies?*

New wireless technology in WiFi and WiMax may soon allow a new breed of internet providers who could offer products to allow the streaming of information, content, and telephony across a wide geographic area. In early 2005, Vonage partnered with TowerStream, a provider of wireless broadband network services in New York City, Chicago, Los Angeles, Boston, and San Francisco. TowerStream has a relatively small user base of only approximately 1,000 business customers and future VoIP opportunities are still unclear.

### **Conclusion**

Michael Snyder was facing a barrage of challenges. Vonage had already raised over \$768 million in funding, most recently from a \$200 million private financing deal in May, 2005 and \$250 million in December later that same year. Nonetheless, the intense marketing campaign and a 300% high growth rate in 2005 necessitated more capital. Vonage looked to go public, but the news release in February, 2006 of an IPO was not being accepted well by the investment community. Facing escalating cost, Snyder wondered what to do next. As the tech savvy early adopter market becomes more saturate, how should Vonage reach out to more mainstream customers? Future options for expansion included new pathways to the customers, but should Vonage try to acquire a wireless service provider or enter as an ISP themselves? Finally, what was to happen if Vonage was unable to raise additional capital? How would it compete with the major cable providers who had deep pockets and were now turning their attention towards VoIP?

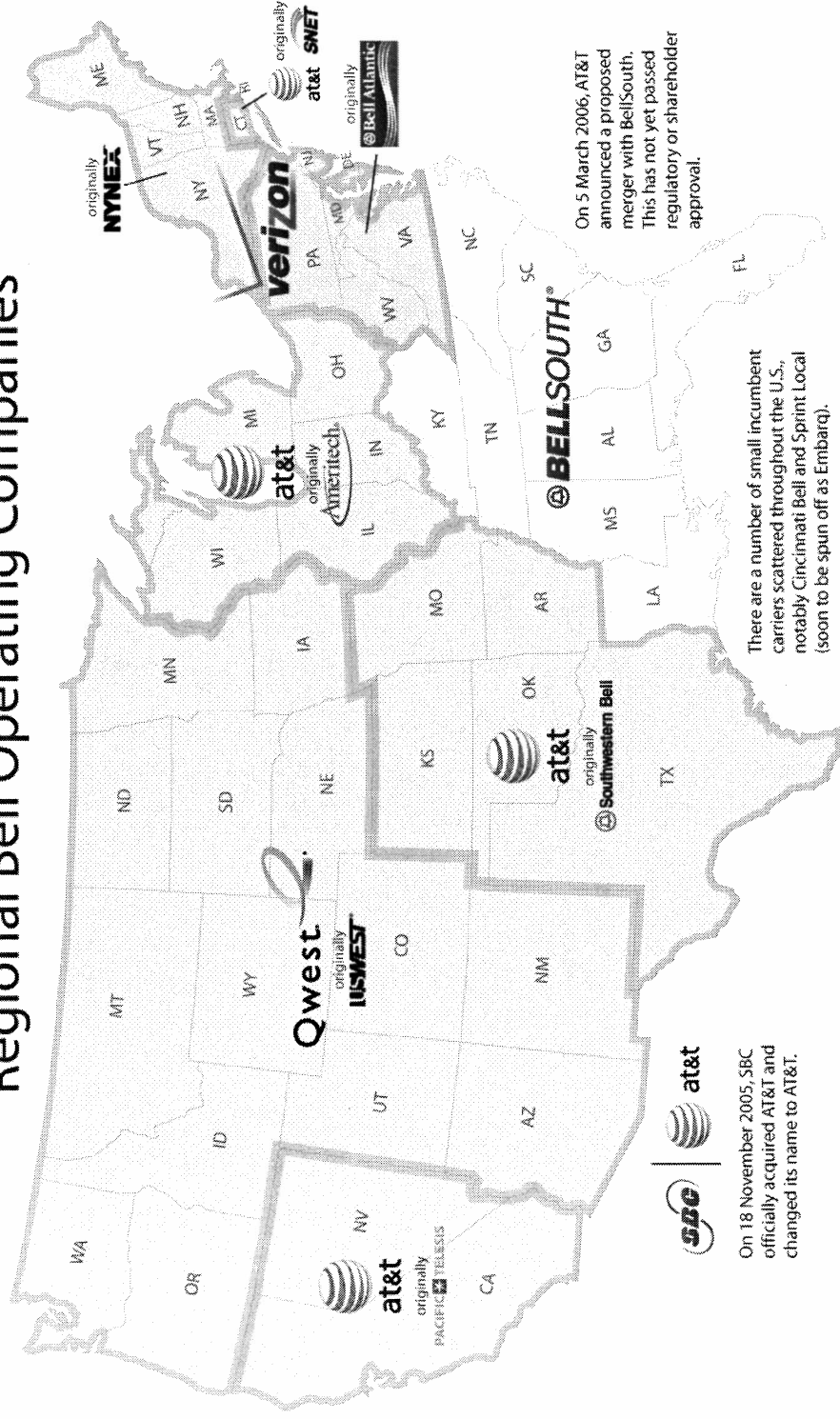
## Exhibit 1: History of Telephony



Source: Casewriter based upon estimations

Exhibit 2: Consolidation Among RBOCs

## Regional Bell Operating Companies



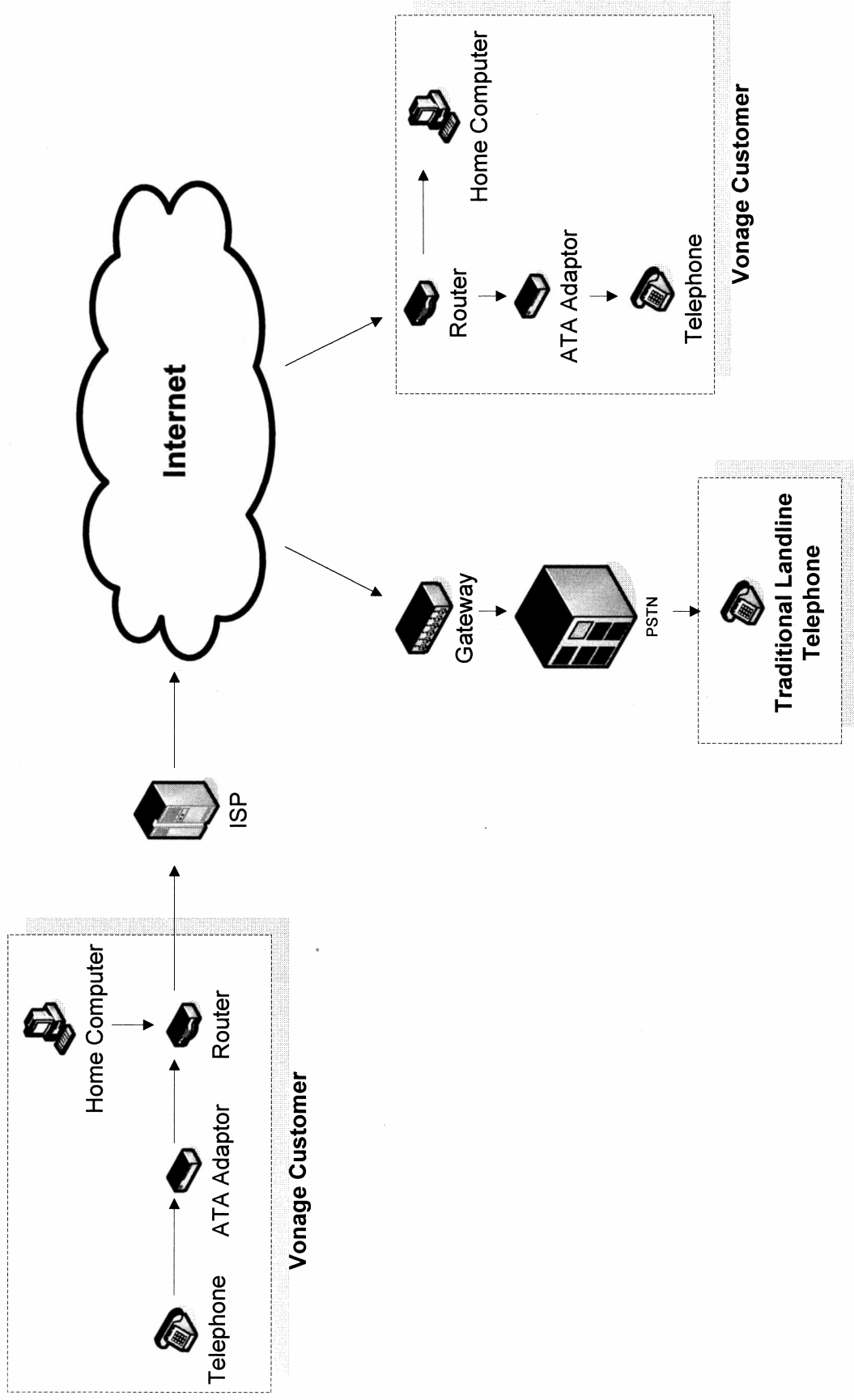
Source: Wikipedia contributors, "Regional Bell Operating Company," Wikipedia, March, 2006.

### Exhibit 3: Estimates of Average Revenue per Conversation Minute

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Interstate operator service revenues	\$7,052	\$6,561	\$6,878	\$6,454	\$7,113	\$6,971	\$5,747	\$6,603	\$5,480	\$3,843	\$2,508
+ Other interstate switched toll revenues	\$36,477	\$38,843	\$42,139	\$47,865	\$42,075	\$42,620	\$45,026	\$38,753	\$32,870	\$26,431	\$24,050
+ International-to-international toll revenues	\$111	\$166	\$249	\$374	\$561	\$1,121	\$983	\$1,087	\$924	\$1,148	\$1,148
+ Charges on bills identified as USF contributions						\$878	\$2,213	\$2,830	\$2,945	\$2,361	\$2,028
+ PICC pass-through reported as SLC revenues						\$1,208	\$0	\$0	\$0	\$0	\$0
- 80% of revenues reported by toll resellers	\$1,001	\$1,251	\$2,582	\$4,211	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
= Total end-user switched toll revenues	\$42,528	\$44,153	\$46,435	\$50,107	\$49,325	\$52,797	\$53,969	\$49,273	\$42,219	\$33,270	\$29,734
- International-to-international toll revenues	\$111	\$166	\$249	\$374	\$561	\$1,121	\$983	\$1,087	\$924	\$636	\$1,148
= U.S. international and interstate end-user switched toll revenues											
End-user international MTS revenues	\$42,417	\$43,987	\$46,186	\$49,733	\$48,764	\$51,677	\$52,986	\$48,186	\$41,295	\$32,634	\$28,586
- International reoriginating revenues	\$11,564	\$12,543	\$14,335	\$14,598	\$15,661	\$14,726	\$14,980	\$14,909	\$11,380	\$9,956	\$8,944
= International-to-international toll revenues	\$0	\$0	\$28	\$43	\$248	\$287	\$370	\$430	\$712	\$574	\$633
- International revenues for U.S. end users	\$140	\$166	\$249	\$374	\$561	\$1,121	\$983	\$1,087	\$924	\$636	\$7,163
Total end-user switched toll revenues	\$11,424	\$12,377	\$14,058	\$14,180	\$14,853	\$13,318	\$13,627	\$13,391	\$13,743	\$8,746	\$1,148
- End-user international MTS revenues	\$44,153	\$46,435	\$50,107	\$49,325	\$52,797	\$53,969	\$49,273	\$42,219	\$33,270	\$29,734	\$29,734
= Interstate domestic switched end-user revenues	\$11,564	\$12,543	\$14,335	\$14,598	\$15,661	\$14,726	\$14,980	\$14,909	\$11,380	\$9,956	\$8,944
	\$30,965	\$31,610	\$32,100	\$35,509	\$33,664	\$38,071	\$39,507	\$34,364	\$30,840	\$23,314	\$20,790
U.S. billed international minutes	11,513	13,616	15,889	19,325	22,753	24,250	28,515	29,216	33,280	35,988	42,664
- Country-direct/beyond minutes	294	350	500	728	1,053	933	1,736	1,935	1,330	1,127	1,422
= Reoriginating minutes	0	0	5	26	98	532	802	1,412	4,414	3,664	5,354
= U.S. billed international minutes excluding country-direct/beyond and reoriginating	11,219	13,266	15,384	18,571	21,602	22,785	25,978	25,869	27,536	31,197	35,888
ILEC originating interstate access minutes	157,114	162,043	169,236	173,300	181,900	184,000	208,267	204,154	194,464	175,092	153,275
+ Estimated CLEC originating minutes	432	580	1,218	1,816	4,118	6,452	12,079	18,034	22,947	21,186	22,991
= U.S. billed international minutes excluding country-direct/beyond and reoriginating	11,219	13,266	15,384	18,571	21,602	22,785	25,978	25,869	27,536	31,197	35,888
= Domestic originating access minutes	146,327	149,357	155,071	156,545	164,416	167,667	194,369	196,319	189,875	165,081	140,378
ILEC terminating interstate access minutes	214,126	239,360	262,712	292,800	315,400	334,465	344,465	363,295	345,306	310,908	290,792
+ Estimated CLEC terminating minutes	589	856	1,891	3,068	7,141	11,739	20,757	32,092	40,746	37,620	43,619
= Country-direct/beyond international settlement minutes	294	350	500	728	1,053	933	1,736	1,935	1,330	1,127	1,422
- Foreign billed international settlement minutes	5,678	6,385	7,121	8,291	9,107	10,208	10,765	12,719	13,478	13,575	13,575
= Domestic terminating access minutes	208,743	233,481	256,982	286,849	312,381	335,398	352,721	380,734	371,245	333,826	319,414
Conversation minutes											
U.S. interstate and international minutes	219,962	246,747	272,366	305,420	333,984	358,183	377,163	406,603	398,780	365,023	355,302
International conversation minutes	11,219	13,266	15,384	18,571	21,602	22,785	25,016	25,869	27,536	31,197	35,888
Interstate domestic conversation minutes	208,743	233,481	256,982	286,849	312,381	335,398	352,147	380,734	371,245	333,826	319,414
End-user revenue per											
U.S. interstate and international minute	\$0.19	\$0.18	\$0.17	\$0.16	\$0.15	\$0.14	\$0.14	\$0.12	\$0.10	\$0.09	\$0.08
International conversation minute	\$1.02	\$0.93	\$0.91	\$0.76	\$0.69	\$0.58	\$0.54	\$0.52	\$0.35	\$0.28	\$0.20
Interstate domestic conversation minute	\$0.15	\$0.14	\$0.12	\$0.12	\$0.11	\$0.11	\$0.11	\$0.09	\$0.08	\$0.07	\$0.07

Note: Dollar Amounts and Minutes Shown in Millions  
Source: FCC Annual Telecommunications Industry Revenue Report, March 1, 2005.

**Exhibit 4: Diagram of VoIP System**



Source: Casewriter based upon estimations

## Exhibit 5: Broadband Growth

	Number of Subscribers (YE 2004)	Number of Subscribers (YE 2005)	Y/Y growth
<b>DSL</b>			
SBC	5,104,000	6,921,000	36%
Verizon	3,600,000	5,144,000	43%
BellSouth	2,096,000	2,882,000	38%
Qwest	1,037,000	1,480,000	43%
<b>Major DSL operators</b>	<b>11,837,000</b>	<b>16,427,000</b>	<b>39%</b>
<i>Estimate of residential-only DSL subscribers (assumes 85%)</i>		<i>13,962,950</i>	
<b>Cable</b>			
Comcast	6,994,000	8,520,000	22%
Time Warner Cable	3,913,000	4,800,000	23%
Cox	2,571,200	3,050,000*	19%
Charter	1,884,400	2,196,400	17%
Cablevision	1,352,500	1,694,300	25%
Adelphia**	1,397,000	1,550,000	11%
Mediacom	367,000	478,000	30%
Insight	330,500	439,200	33%
<b>Major US cable operators</b>	<b>18,809,600</b>	<b>22,727,900</b>	<b>21%</b>
<b>Total reported subscribers for DSL and cable</b>		<b>39,154,900</b>	

\*Note: Estimated based on 2,846,400 subs in Q2 2005, with the assumption of approximately 100,000 added subscribers per quarter.

\*\*Note: Adelphia last reported June 2005 before it was acquired by Time Warner and Comcast.

Source: Maribel Lopez, "The State of Internet Access," Forrester Research, April, 2006.

# Exhibit 6: VoIP Growth

Date	Analysts	Estimates Number of VoIP Subscribers (millions)						2004-2009 CAGR	
		2004	2005	2006	2007	2008	2009		
07/06	Forrester Research	0.9	2.8	5.0	8.2	9.8	11.5		66%
06/06	Gartner	1.0	2.4	5.6	10.7	19.5	32.1		99%
06/06	Yankee Group	1.1	3.3	8.4	15.3	21.8	28.5		92%
06/06	Frost & Sullivan	1.5	5.0	8.2	11.2	14.0	16.5		61%
06/06	TeleGeography Research	1.3	4.4	7.7	11.6	15.2	17.6		68%
03/06	IDC	1.0	3.1	6.3	11.7	19.4	27.5		95%
4Q04	ABI Research	0.9	2.0	4.6	8.9	14.5	22.3		90%

## Source:

"VoIP Liberates Voice From The Phone," Forrester Research , Inc., July, 2005.

"Forecast: Consumer Telecommunications and Internet Access, United States, 2003-2009", Gartner, June, 2005.

"Consumer Market for US Residential VoIP Services Accelerates," Yankee Group, June 27, 2005.

Projections for North American residential lines in service.

Projects are for U.S. households.

"US Residential VoIP Services 2005-2009," March 2005.

Projections for North American residential subscribers.



## Exhibit 7: VoIP Providers and Service

Provider				
Pure plays		Plan description	Price per month†	VoIP subscribers‡
AT&T CallVantage		Unlimited US and Canada	\$29.99	53,000
Broadvoice		Unlimited 21 countries	\$19.95	N/A
		Unlimited in state of your choice	\$9.95	
Lingo		Unlimited US, Canada, and Western Europe	\$19.95	N/A
		500 min. US, Canada, and Western Europe	\$14.95 + \$0.03/min. over	
Net2Phone		Unlimited US and Canada	\$29.99	13,000
		500 min. US and Canada	\$14.99 + \$0.04/min. over	
Packet 8		Unlimited US and Canada	\$19.95	30,000
		Freedom International (live outside US, get 1,000 min. to US)	\$19.95 + \$0.04/min. over	
Vonage		Unlimited US and Canada	\$24.99	390,000 (US and Canada)
		500 min. US and Canada	\$14.99 + \$0.04/min. over	
Cable				
Cox		Unlimited US	\$39.95	300,000 (Includes some circuit voice)
		500 min. local and LD US	\$25 + \$0.05/min. over	
		250 min. local and LD US	\$15 + \$0.07/min. over	
		US local and LD	No monthly; \$0.05/min. local, \$0.10/min. LD	
Time Warner		Unlimited US and Canada	\$39.95	200,000
Cablevision		Unlimited US and Canada	\$34.95	250,000
Traditional telephony				
Verizon Voicewing		Unlimited US and Canada (with Verizon DSL)	\$29.95 for 12 months; \$34.95 after	Est. 25,000
		Unlimited US and Canada (without Verizon DSL)	\$34.95	
		500 local and LD	\$19.95 + \$0.04 /min. over	
Portals				
AOL		Unlimited US and Canada	\$29.99	Just released
P2P				
TelTel		SIP-based and PC-to-PC	Free	800K worldwide downloads
Skype		PC-to-PC and PC-to-phone	Free PC-to-PC; \$0.02 per min. PC-to-phone	86M worldwide downloads

\*not an inclusive list as of 6/15/05

<sup>†</sup>prices as of 6/15/05

<sup>‡</sup>as of 12/04

Source: Forrester Research, Inc.

**Exhibit 8: Vonage Income Statement**

		2001	2002	2003	2004	2005
Operating Revenues						
Telephony Service			797	16,905	75,864	167,280
Customer Equipment & Shipping			174	1,817	3,844	6,736
Total Operating Revenues			971	18,722	79,708	174,016
Cost of Goods Sold						
Direct Cost of Telephony Service			1,599	8,556	23,209	54,341
Direct Cost of Goods Sold			855	4,867	18,878	30,451
Total Costs of Goods Sold			2,454	13,423	42,087	84,792
Gross Profit (Loss)			(1,483)	5,299	37,621	89,224
Gross Profit Margin			-	28.3%	47.2%	51.3%
Operating Expenses						
Selling, General & Administrative	312	6,846	7,846	19,174	49,186	98,808
Marketing	132	50	1,983	11,819	56,075	176,279
Total Operating Expenses	444	6,896	9,829	30,993	105,261	275,087
Depreciation & Amortization	55	550	1,114	2,367	3,907	7,026
Net Income (Loss)	(499)	(7,446)	(12,426)	(28,061)	(71,547)	(192,889)
Nonoperating Income			87	101	1,156	3,270
Nonoperating Expenses			(403)	(2,235)	(5)	(1)
Income (Loss) Before Taxes	(499)	(7,446)	(12,742)	(30,195)	(70,396)	(189,620)
Income Tax (Benefit)				(221)	(475)	
<b>Net Income (Loss) After Taxes</b>	<b>(499)</b>	<b>(7,446)</b>	<b>(12,742)</b>	<b>(29,974)</b>	<b>(69,921)</b>	<b>(189,620)</b>

Note: All dollar amounts in thousands, Year 2005 unaudited  
Source: Company report

**Exhibit 10: Vonage Balance Sheet Statement**

	<b>2003</b>	<b>2004</b>	<b>2005*</b>
<b>Current Assets</b>			
Cash	14,245	43,029	42,931
Marketable Securities		62,739	83,323
Net Receivables	654	2,695	5,355
Inventories	1,116	1,190	9,796
Other Current Assets	1,630	6,775	18,429
<b>Total Current Assets</b>	<b>17,645</b>	<b>116,428</b>	<b>159,834</b>
Net Fixed Assets	9,325	16,290	68,608
Other Noncurrent Assets	1,341	3,775	22,256
<b>Total Assets</b>	<b>28,311</b>	<b>136,493</b>	<b>250,698</b>
<b>Current Liabilities</b>			
Accounts Payable	8,276	11,295	32,920
Short-Term Debt	-	-	-
Other Current Liabilities	4,548	35,866	87,471
<b>Total Current Liabilities</b>	<b>12,824</b>	<b>47,161</b>	<b>120,391</b>
Long-Term Debt	-	-	-
Other Noncurrent Liabilities	1,214	3,884	38,606
<b>Total Liabilities</b>	<b>14,038</b>	<b>51,045</b>	<b>158,997</b>
Preferred Stock Equity	51,409	192,521	388,510
Common Stock Equity	37,136	107,073	296,809
<b>Total Equity</b>	<b>14,273</b>	<b>85,448</b>	<b>91,701</b>

Note: All dollar amounts in thousands

Y2005 is unaudited and through September 30, 2005

Source: Company report

**Exhibit 11: Vonage Cash Flow Statement**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005*</b>
Net Operating Cash Flow	(11,140)	(16,583)	(38,600)	131,155
Net Investing Cash Flow	(4,935)	(4,933)	(73,707)	(64,914)
Net Financing Cash Flow	14,804	34,226	141,094	195,994
Net Change in Cash	(1,271)	12,710	28,784	(98)
Depreciation & Amortization	1,114	2,367	3,907	7,026
Capital Expenditures	(3,348)	(6,430)	(10,867)	(37,180)

Note: All dollar amounts in thousands







Y2005 is unaudited and through September 30, 2005

Source: Company report

## Exhibit 12: Vonage Service Plans

Products and Services	
<div> <div>Services</div> <div> <div>\$24<sup>99</sup></div> <div>Premium Unlimited</div> <div>Calls to anywhere in the US &amp; Canada</div> <div>more ▶</div> </div> </div>	<div> <div>\$49<sup>99</sup></div> <div>Small Business Unlimited</div> <div>Calls to anywhere in the US &amp; Canada</div> <div>more ▶</div> </div>
<div> <div>\$14<sup>99</sup></div> <div>Basic 500 Plan</div> <div>500 minutes anywhere in the US &amp; Canada</div> <div>more ▶</div> </div>	<div> <div>\$39<sup>99</sup></div> <div>Small Business Basic</div> <div>1500 local/long distance minutes anywhere in the US &amp; Canada</div> <div>more ▶</div> </div>


## Exhibit 13: Vonage Hardware Offerings

Device	Description	Price	Benefits
<b>Motorola VT100S</b> 	2 Vonage lines and a full use router with 1 Ethernet port	Original Price \$69.99 Instant Rebate \$69.99 Price After Rebate <b>FREE</b>	Great for all your phone and routing needs
<b>Motorola VT2442</b> 	2 Vonage lines and a full use router with 4 Ethernet ports	Original Price \$79.99 Instant Rebate \$70.00 Price After Rebate <b>\$9.99</b>	Great for all your routing needs and creating a home network with multiple computers
<b>Linksys WRT54G</b> 	2 Vonage lines and a full use wireless router with 4 Ethernet ports	Original Price \$99.99 Instant Rebate \$50.00 Price After Rebate <b>\$49.99</b>	Great for all your routing needs and creating a wireless home network
<b>VTech IP8100-1</b> 	Supports 1 Vonage line cordless phone and a basic 1 Ethernet port router	Original Price \$99.99 Instant Rebate \$50.00 Price After Rebate <b>\$49.99</b>	Great for instant multiple phones per line - no home wiring installation needed
<b>VTech IP8100-2</b> 	Supports 1 Vonage line cordless phone with multiple handsets and a basic 1 Ethernet port router	Original Price \$149.99 Instant Rebate \$50.00 Price After Rebate <b>\$99.99</b>	Great for instant multiple phones per line - no home wiring installation needed
<b>WiFi UTStarcom F1000</b> 	Supports 1 Vonage line in a small, wireless Internet phone	Original Price \$129.99 Instant Rebate \$50.00 Price After Rebate <b>\$79.99</b>	A pocket-sized wireless Internet phone that can be used at WiFi hotspots worldwide

Source: Company website ([www.vonage.com](http://www.vonage.com)).

Exhibit 14: Vonage Marketing Ad

Now your teenagers can talk on the phone for hours. More hours, we mean.



No hidden costs. No contracts. No extra numbers to dial.

**\$24.99\*** a month

The Vonage Premium Unlimited Plan lets you (and your teenager!) make unlimited calls to anywhere in the United States and Canada 24/7 for a low flat fee of \$24.99 a month.

All you need is a broadband connection and you're ready to start saving money.

If you have any kind of high-speed Internet connection in your home, then you have what it takes to start saving big money. Once you sign up, just plug your Vonage phone adapter into your regular corded or cordless touchtone phone. Don't worry - your computer doesn't have to be on for you to make calls, and it's not complicated to set up. In fact, the whole thing takes less than five minutes to install.

Free features, including Voicemail, Caller ID, Call Forwarding, and 3-Way Calling (to name a few). We don't believe that families should have to pay extra for phone features. That's why we give you the services listed above, plus a whole lot more, at no additional cost.

It's a no-brainer.

This isn't the toughest decision you'll make today, but it may be the smartest one. There really is no reason why you should be paying so much for phone service. After all, you already have broadband in your home. Why not use it to save big money on your phone bill?

Three easy ways to sign up:  
Call 866.699.VON (4664), go to [VONAGE.COM](http://VONAGE.COM)  
or visit one of the fine retailers listed below.

**VONAGE**  
THE BROADBAND PHONE COMPANY

[www.vonage.com](http://www.vonage.com)

Best Buy, Best Buy, CompUSA, RadioShack, Staples

Source: Company website ([www.vonage.com](http://www.vonage.com)).

**Exhibit 15: Political Contributions**

Company	Individual donations				PAC contributions						Soft money		
	2002	2004	2006*		1998	2000	2002	2004	2006*		1998	2000	2002
Amazon.com	84,316	230,275	32,619			0	14,000	20,500	106,750	13,000	844	6,574	0
Apple Computer	28,400	173,170	19,600			0	0	0	0	0	0	60,000	56,050
AT&T	191,693	348,519	31,755		974,879	780,720	464,912	404,000	140,500	1,024,493	3,760,020	3,146,971	
Cisco Systems	181,573	855,133	63,391		0	0	10,000	271,000	89,400	115,500	690,383	367,038	
Comcast	131,772	726,060	69,700		161,475	250,900	259,350	540,050	248,700	0	199,500	197,500	
Dell	114,002	344,677	41,300		0	0	6,500	120,888	41,000	0	505,599	425,250	
eBay	79,800	170,462	57,775		0	57,000	122,500	124,254	41,717	0	38,500	103,050	
Google	29,000	207,650	33,750		0	0	0	0	0	0	0	10,000	
IBM	158,069	728,819	56,859		0	0	0	0	0	0	0	0	
Intel	81,470	315,486	15,830		81,007	205,287	251,779	286,864	78,449	0	0	0	
Microsoft	707,753	2,104,320	164,014		212,000	820,999	815,201	1,213,200	259,000	779,816	2,317,226	2,691,244	
Motorola	45,350	152,052	16,600		108,556	213,000	138,556	248,605	73,000	103,500	430,789	239,550	
SBC	172,268	433,066	17,900		963,485	1,749,738	1,602,945	1,954,116	577,800	470,361	1,787,228	1,247,184	
Sun Microsystems	131,198	233,710	16,760		0	31,300	53,250	80,250	22,500	6,500	24,000	12,500	
Time Warner	785,626	2,712,944	398,350		388,073	534,762	542,352	545,073	96,500	498,000	1,617,310	451,919	
Verizon	172,268	400,368	60,040		942,295	2,017,117	1,183,160	1,003,164	334,800	909,519	1,787,228	1,541,137	
Viacom	272,600	1,086,021	87,337		240,288	235,961	272,600	359,500	83,500	46,000	41,405	1,363,541	
Vonage Holdings	2,000	11,550	5,500		0	0	0	0	0	0	0	0	
Yahoo	58,250	306,600	50,500		0	0	14,000	81,500	34,000	20,691	0	30,000	

Note: 2006 figures are incomplete

Source: Federal Election Commission filings compiled by the Center for Responsive Politics.

## Endnotes

- 
- <sup>1</sup> Vonage Company Website, URL: [www.vonage.com/corporate/aboutus\\_fastfacts.php](http://www.vonage.com/corporate/aboutus_fastfacts.php), April, 2006.
- <sup>2</sup> Stone, Alan, How America Got On-Line: Politics, Markets, and the Revolution in Telecommunications, M.E. Sharpe, August, 1997, p. 22.
- by Alan Stone
- <sup>3</sup> Williamson, Samuel H., "What is the Relative Value?," Economic History Services, URL: [www.eh.net/hmit/compare](http://www.eh.net/hmit/compare), April 2004.
- <sup>4</sup> Casson, Herbert, The History Of The Telephone, 1st World Library, December, 2004, p. 39.
- <sup>5</sup> Bell, Alexander Graham, "To the Capitalists of the Electric Telephone Co.," London, England, March 25, 1878.
- <sup>6</sup> Massey, David and Jackson, Ben, "The Bell System Memorial," URL: [www.bellsystemmemorial.com](http://www.bellsystemmemorial.com), March, 2006.
- <sup>7</sup> Massey, David and Jackson, Ben, "The Bell System Memorial," URL: [www.bellsystemmemorial.com](http://www.bellsystemmemorial.com), March, 2006.
- <sup>8</sup> Todd, Kenneth, A Capsule History of the Bell System, American Telephone and Telegraph Co., January 1, 1977, p. 13.
- <sup>9</sup> Todd, Kenneth, A Capsule History of the Bell System, American Telephone and Telegraph Co., January 1, 1977, p. 16.
- <sup>10</sup> AT&T Company Website, "History of AT&T," URL: [www.att.com/history/history1](http://www.att.com/history/history1), March, 2006.
- <sup>11</sup> Todd, Kenneth, A Capsule History of the Bell System, American Telephone and Telegraph Co., January 1, 1977, p. 31.
- <sup>12</sup> Farley, Tom, "Telephone History," URL: [www.privateline.com](http://www.privateline.com), March, 2006.
- <sup>13</sup> AT&T Company Website, "A Brief History: The Bell System," URL: [www.att.com](http://www.att.com), March, 2006.
- <sup>14</sup> Armstrong, Michael, "Break Up the Baby Bells!," Wall Street Journal, March 28, 2001.
- <sup>15</sup> Gartner Research, "Forecast: Fixed Public Network Services, United States, 2003-2009", May 2005.
- <sup>16</sup> Reddy, Raj, "A Gigabit National Data Grid/Fiber-to-the-Home (GNDG/FTTH) Initiative for Computer Mediated Communications," URL: [www.rr.cs.cmu.edu/ndg/gndg-ftth](http://www.rr.cs.cmu.edu/ndg/gndg-ftth), June, 1997.
- <sup>17</sup> Pulver, Jeff, "An Interview with Elon Ganor," VON Magazine, September/October, 2003.
- <sup>18</sup> Landry, Chris, "How Much Bandwidth is Required for VoIP Phones?," URL: [www.ezinearticles.com](http://www.ezinearticles.com) August, 2005.
- <sup>19</sup> Savitz, Eric, "Vonage's Wrong Numbers," Barons, February 13, 2006
- <sup>20</sup> Jeff Citron speaking at the "FCC VoIP Forum," Washington DC, December 1, 2003.
- <sup>21</sup> Rojas, Peter, "The Engadget Interview: Jeffrey Citron, chairman and CEO of Vonage," URL: [www.engadget.com/2005/05/23/the-engadget-interview-jeffrey-citron-chairman-and-ceo-of](http://www.engadget.com/2005/05/23/the-engadget-interview-jeffrey-citron-chairman-and-ceo-of), May 23, 2005.
- <sup>22</sup> O'Connell, Patricia "At SBC, It's All About Scale and Scope", BusinessWeek Online, November 7, 2005.

## Endnotes

- 
- <sup>1</sup> Vonage Company Website, URL: [www.vonage.com/corporate/aboutus\\_fastfacts.php](http://www.vonage.com/corporate/aboutus_fastfacts.php), April, 2006.
- <sup>2</sup> Stone, Alan, How America Got On-Line: Politics, Markets, and the Revolution in Telecommunications, M.E. Sharpe, August, 1997, p. 22.
- by Alan Stone
- <sup>3</sup> Williamson, Samuel H., "What is the Relative Value?," Economic History Services, URL: [www.eh.net/hmit/compare](http://www.eh.net/hmit/compare), April 2004.
- <sup>4</sup> Casson, Herbert, The History Of The Telephone, 1st World Library, December, 2004, p. 39.
- <sup>5</sup> Bell, Alexander Graham, "To the Capitalists of the Electric Telephone Co.," London, England, March 25, 1878.
- <sup>6</sup> Massey, David and Jackson, Ben, "The Bell System Memorial," URL: [www.bellsystemmemorial.com](http://www.bellsystemmemorial.com), March, 2006.
- <sup>7</sup> Massey, David and Jackson, Ben, "The Bell System Memorial," URL: [www.bellsystemmemorial.com](http://www.bellsystemmemorial.com), March, 2006.
- <sup>8</sup> Todd, Kenneth, A Capsule History of the Bell System, American Telephone and Telegraph Co., January 1, 1977, p. 13.
- <sup>9</sup> Todd, Kenneth, A Capsule History of the Bell System, American Telephone and Telegraph Co., January 1, 1977, p. 16.
- <sup>10</sup> AT&T Company Website, "History of AT&T," URL: [www.att.com/history/history1](http://www.att.com/history/history1), March, 2006.
- <sup>11</sup> Todd, Kenneth, A Capsule History of the Bell System, American Telephone and Telegraph Co., January 1, 1977, p. 31.
- <sup>12</sup> Farley, Tom, "Telephone History," URL: [www.privateline.com](http://www.privateline.com), March, 2006.
- <sup>13</sup> AT&T Company Website, "A Brief History: The Bell System," URL: [www.att.com](http://www.att.com), March, 2006.
- <sup>14</sup> Armstrong, Michael, "Break Up the Baby Bells!," Wall Street Journal, March 28, 2001.
- <sup>15</sup> Gartner Research, "Forecast: Fixed Public Network Services, United States, 2003-2009", May 2005.
- <sup>16</sup> Reddy, Raj, "A Gigabit National Data Grid/Fiber-to-the-Home (GNDG/FTTH) Initiative for Computer Mediated Communications," URL: [www.rr.cs.cmu.edu/ndg/gndg-ftth](http://www.rr.cs.cmu.edu/ndg/gndg-ftth), June, 1997.
- <sup>17</sup> Pulver, Jeff, "An Interview with Elon Ganor," VON Magazine, September/October, 2003.
- <sup>18</sup> Landry, Chris, "How Much Bandwidth is Required for VoIP Phones?," URL: [www.ezinearticles.com](http://www.ezinearticles.com) August, 2005.
- <sup>19</sup> Savitz, Eric, "Vonage's Wrong Numbers," Barons, February 13, 2006
- <sup>20</sup> Jeff Citron speaking at the "FCC VoIP Forum," Washington DC, December 1, 2003.
- <sup>21</sup> Rojas, Peter, "The Engadget Interview: Jeffrey Citron, chairman and CEO of Vonage," URL: [www.engadget.com/2005/05/23/the-engadget-interview-jeffrey-citron-chairman-and-ceo-of](http://www.engadget.com/2005/05/23/the-engadget-interview-jeffrey-citron-chairman-and-ceo-of), May 23, 2005.
- <sup>22</sup> O'Connell, Patricia "At SBC, It's All About Scale and Scope", BusinessWeek Online, November 7, 2005.